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PATENT

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Naoto Oku et al.

Art Unit: 1635

Serial No.: 09/623,307

Examiner: J. Epps

Filed: March 21, 2001

Customer No.: 21559

Title: COMPOSITION FOR TRANSPORTING NEGATIVELY CHARGED  
SUBSTANCES

Assistant Commissioner For Patents  
Washington, DC 20231

REPLY TO EXAMINER'S ACTION

In reply to the Examiner's Action mailed August 29, 2001, Applicants make the following amendments and remarks.

AMENDMENTS

Please amend claims 26-30, 32, 33, 36, 37, 39, 40, 44-46, and 50 as follows.

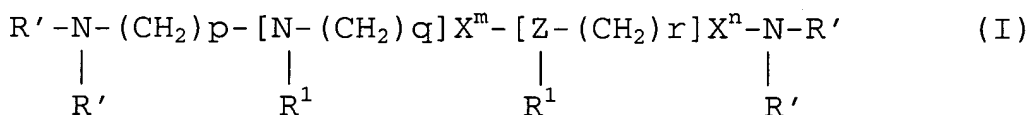
26. (Amended) A water-soluble composition comprising a polyalkylenimine or a salt thereof, wherein said polyalkylenimine or said salt comprises (a) two or more

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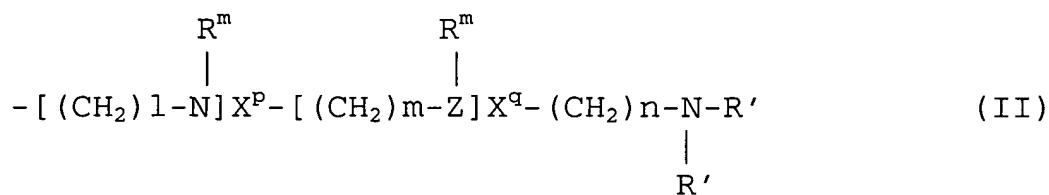
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hydrophobic groups, (b) seven or more nitrogen atoms, and (c) a base skeleton that does not comprise a carbonyl group.

27. (Amended) The composition of Claim 26, wherein the hydrophobic group is a cholesterol residue, a saturated or unsaturated alkyl group, a saturated or unsaturated acyl group, or a phospholipid residue.

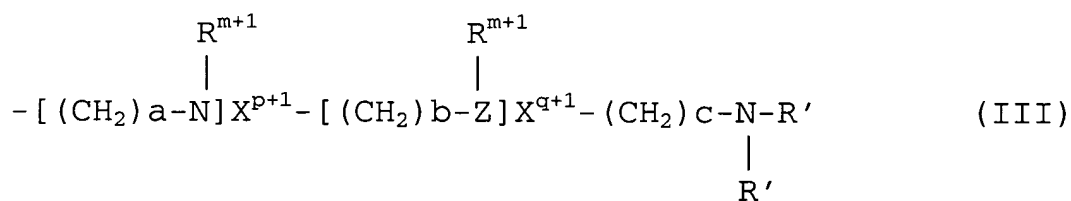
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cont.  
28. (Amended) The composition of Claim 26, wherein the polyalkylenimine is a compound represented by formula (I):



wherein the base skeleton may contain an amide bond; Z represents a carbon or nitrogen atom; R' represents hydrogen, a cholesterol residue, a saturated or unsaturated alkyl group, a saturated or unsaturated acyl group, or a phospholipid residue; two R's binding to the same nitrogen atom can be identical or different; a side chain R<sup>1</sup> is hydrogen, a cholesterol residue, a saturated or unsaturated alkyl group, a saturated or unsaturated acyl group, a phospholipid residue, or below formula (II); and p, q, r, X<sup>n</sup>, and X<sup>m</sup> represent arbitrary natural numbers:

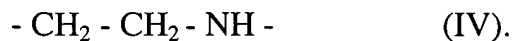


wherein the side chain  $\text{R}^m$  may comprise an amide bond; Z represents a carbon or nitrogen atom;  $\text{R}'$  represents hydrogen, a cholesterol residue, a saturated or unsaturated alkyl group, a saturated or unsaturated acyl group, or a phospholipid residue; two  $\text{R}'$ 's binding to the same nitrogen atom can be identical or different; a side chain  $\text{R}^m$  is hydrogen, a cholesterol residue, a saturated or unsaturated alkyl group, a saturated or unsaturated acyl group, a phospholipid residue, or below formula (III); and  $l$ ,  $m$ ,  $n$ ,  $\text{X}^p$ , and  $\text{X}^q$  represent arbitrary natural numbers:



wherein the side chain  $\text{R}^{m+1}$  may comprise an amide bond; Z represents a carbon or nitrogen atom;  $\text{R}'$  represents hydrogen, a cholesterol residue, a saturated or unsaturated alkyl group, a saturated or unsaturated acyl group, or a phospholipid residue; two  $\text{R}'$ 's binding to the same nitrogen atom can be identical or different; and  $a$ ,  $b$ ,  $c$ ,  $\text{X}^{p+1}$ , and  $\text{X}^{q+1}$  represent arbitrary natural numbers.

29. (Amended) The composition of Claim 28, comprising the repeating structure of formula (IV) in the base skeleton:



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30. (Amended) The composition of Claim 29, wherein two to five molecules of tetraethylenepentamine are linked in a linear manner.

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B2  
32. (Amended) The composition of Claim 30, wherein any two or more of side chains R', R<sup>1</sup>, R<sup>m</sup>, or R<sup>m+1</sup> comprise a group selected from the group consisting of butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, and octadecyl groups.

33. (Amended) The composition of Claim 29, wherein the structures of formula (IV) are linked in a branched manner.

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B3  
36. (Amended) The composition of Claim 28, wherein the base skeleton comprises one or more spermine structures.

37. (Amended) The composition of Claim 36, wherein two to five molecules of spermine are linked in a linear manner.

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39. (Amended) The composition of Claim 36, wherein any two or more of side chains  $R'$ ,  $R^1$ ,  $R^m$ , or  $R^{m+1}$  comprise a group selected from the group consisting of butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, and octadecyl groups.

40. (Amended) The composition of Claim 36, wherein the spermine structures are linked in a branched manner.

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44. (Amended) The composition of Claim 43, wherein the phospholipid is a neutral or basic phospholipid.

45. (Amended) The composition of Claim 44, wherein the phospholipid comprises a phosphatidylethanolamine or phosphatidylcholine skeleton.

46. (Amended) The composition of Claim 44, wherein the phospholipid is a dioleylphosphatidylethanolamine or phosphatidylcholine.

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50. (Amended) A kit for preparing the composition of Claim 44, comprising a phospholipid and a polyalkylenimine or a salt thereof having two or more hydrophobic groups per molecule.